Statement of Basis

Minor Air Quality Permit Renewal

Graphic Packaging International, Inc.

Mitchell, South Dakota

South Dakota
Department of Environment and Natural Resources

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1.0 BACKGROUND

On January 18, 2000, Universal Packaging Corporation submitted an application for an air quality operating permit for their web printing and food-grade packaging manufacturing facility in Mitchell, South Dakota. A minor air quality permit was issued on April 18, 2000.

The name of the facility was changed from Universal Packaging Corporation to Graphic Packaging Corporation by an administrative permit amendment on March 5, 2003. On June 9, 2003, Graphic Packaging Corporation requested a minor permit amendment to change the flexographic printing deck of two existing Komori Chambon presses to add rotogravure printing capability. The department agreed that the changes did not result in an increase in emissions and the permit was amended on June 20, 2003.

On April 8, 2003, Graphic Packaging Corporation submitted an application to modify the permit by replacing the existing sheet fed (non-continuous) printing equipment with web printing equipment. The new press was similar to two of the existing web presses at the facility.

On August 5, 2003, Graphic Packaging Corporation notified the department that it had merged with Riverwood International Corporation to form Graphic Packaging International, Inc. The name change was considered an administrative permit amendment.

On October 14, 2004, DENR received an application to renew the minor air quality permit. DENR considered the renewal application timely and Graphic Packaging is allowed to operate under the minor air quality permit that expired April 15, 2005, until DENR takes action on the renewal application. On December 28, 2007, Graphic Packaging was issued a renewed minor operating permit.

On August 2, 2012, DENR received an application from Graphic Packaging International (Graphic Packaging) to renew the minor air quality permit that will expire on December 28, 2012.

1.1 Existing Equipment

Table #1-1 provides a description of the permitted units, which was derived from the existing permit issued December 28, 2007.

Table #1-1: Description of Permitted Units, Operations, and Processes

Unit	Description	Maximum Operating Rate	Control Device
#2	**Press 614** – 1996 Hamilton System 4000, Serial #95155 with Bossaire Dryer, Model #EXI-483-40. A combination offset lithographic/flexographic web printing press with integral curing/drying operations. The press contains the following operations: Offset Inking, Flexographic Inking, Flexographic Coating and Drying, Ultra Violet Curing, Electron Beam Curing, and Cutting. The two flexographic dryers each have a heat capacity of 2 million BTU per hour and operate on natural gas.	Each dryer – 2 million Btus per hour	Not applicable

Unit	Description	Maximum Operating Rate	Control Device
#3	**Press 615** – 1996 Hamilton System 4000, Serial #95156, with Bossaire Dryver, Model #EXI-483-40. A combination offset lithographic/flexographic web printing press with integral curing/drying operations. The press contains the following operations: Offset Inking, Flexographic Inking, Flexographic Coating and Drying, Ultra Violet Curing, Electron Beam Curing, and Cutting. The two flexographic dryers each have a heat capacity of 2 million BTU per hour and operate on natural gas.	Each dryer – 2 million Btus per hour	Not applicable
#4	**Press 616** – 1999 Komori Chambon, Model #OR-32. A combination offset lithographic/flexographic/ rotogravure web printing press with integral curing/drying operations. The press contains the following operations: Offset Inking, Flexographic or Rotogravure Coating and Drying, Infrared Curing, Electron Beam Curing, and Cutting.		Not applicable
#5	**Common Evaporator** – 1996 Environmental Products/Acra Electric Corp., Model # MRU 30t evaporator. The evaporator is electrically operated. The spent fountain solution from Presses 614, 615, 616, 617 and 618 are transferred to the evaporator.		Not applicable
#6	**Baler** – 1996 Balemaster Baler, Model #4025G-8. Packaging from Presses 614, 615, 616, 617 and 618 which does not meet customer specifications is collected in the baler. The material is pneumatically transferred to a cyclone separator. The cyclone separator vents inside the warehouse to a baghouse. The baghouse exhausts to the manufacturing area.		Not applicable
#7	**Press 617** – 2000 Komori Chambon, Model #OR-32. A combination offset lithographic/flexographic/ rotogravure web printing press with integral curing/drying operations. The press contains the following operations: Offset Inking, Flexographic or Rotogravure Inking, Flexographic or Rotogravure Coating and Drying, Electron Beam Curing, and Cutting.		Not applicable
#8	**Press 618** – 1996 Hamilton System 4000, Serial #S96246, with a Bossaire Dryer, Model #EXI-483-40. A combination offset lithographic/flexographic/ rotogravure web printing press with integral curing/drying operations. The press contains the following operations: Offset Inking, Flexographic or Rotogravure Inking, Flexographic or Rotogravure Coating and Dying, Ultra Violet Curing, Electron Beam Curing, and Cutting. The one flexographic dryers each have a heat capacity of 2 million BTU per	Each dryer – 2 million Btus per hour	Not Applicable

Unit	Description	Maximum Operating Rate	Control Device
	hour and operate on natural gas.		

1.2 Insignificant Activities

The following are insignificant activities that have been reported by Graphic Packaging in the application and or have been verified during inspections:

Insignificant Activity
2 RTU Units – 1st stage 100,000 Btus – 2nd stage 150,000 Btus
3 RTU Units – 1st stage 90,000 Btus
1 RTU Unit – 1st stage 120,000 Btus
15 RTU Units – 1st stage 175,000 Btus – 2nd stage 250,000 Btus
8 Unit Heaters – 175,000 Btus
2 Unit Heaters – 300,000 Btus
2 Unit Heaters – 350,000 Btus
2 Furnace Units – 100,000 Btus
1 Furnace Unit – 150,000 Btus

In accordance with ARSD 74:36:04:03, these units are considered insignificant activities because each has a heat input not greater than 3.5 million Btus per hour.

2.0 New Source Performance Standards

Presently, there are no finalized or promulgated New Source Performance Standards applicable to this type of operation.

3.0 New Source Review

Administrative Rules of South Dakota (ARSD) 74:36:10:01 notes that new source review regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. Graphic Packaging is located in Mitchell, South Dakota, which is in attainment for all the pollutants regulated under the Clean Air Act. Therefore, Graphic Packaging is not subject to new source review.

4.0 Prevention of Significant Deterioration

A prevention of significant deterioration (PSD) review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated pollutant. The following is a list of regulated pollutants under the PSD program:

- Total suspended particulate (PM);

- Particulate with a diameter less than or equal to 10 microns (PM10);
- Particulate with a diameter less than or equal to 2.5 microns (PM2.5);
- Sulfur dioxide (SO2);
- Nitrogen oxides (NOx);
- Carbon monoxide (CO);
- Ozone – measured as volatile organic compounds (VOCs);
- Lead;
- Fluorides;
- Sulfuric acid mist;
- Hydrogen sulfide;
- Reduced sulfur compounds;
- Total reduced sulfur; and
- Greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.).

If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated pollutant. The major source threshold for all other sources is 250 tons per year of any regulated pollutant.

Graphic Packaging is not included in the 28 source categories listed; therefore, the PSD threshold for this facility is 250 tons per year.

According to the Clean Air Act, once a pollutant is regulated under any part of the Act, (as was the case with greenhouse gas emissions after the motor vehicle regulations were finalized in March 2010) major new sources or major modifications are subject to the PSD program and Title V air quality operating permit program. Under the Clean Air Act, PSD and Title V air quality operating permits are required for all sources that emit a regulated air pollutant above 100 or 250 tons per year, depending on the source. This threshold, if applied to greenhouse gases, would greatly increase the number of facilities requiring a PSD review or Title V air quality operating permit. Based on administrative necessity, EPA increased these thresholds through the "Tailoring Rule."

On May 13, 2010, EPA issued the final version of the "Tailoring Rule" for greenhouse gas emissions. The major source threshold for greenhouse gases is listed below:

1. New PSD source because of a criteria air pollutant, the major source threshold for greenhouse gases is 75,000 tons per year of carbon dioxide equivalent or more;
2. New PSD source if greenhouse gas emissions are 100,000 tons per year of carbon dioxide equivalent or more;
3. For an existing PSD source because of a criteria air pollutant, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more;
4. For an existing non-PSD source that has the potential to emit 100,000 tons per year of carbon dioxide equivalent emissions or more, a major modification for greenhouse gases is an increase of 75,000 tons per year of carbon dioxide equivalent or more; and
5. In addition to subsection (2) and (4), a specific greenhouse gas, without calculating the carbon dioxide equivalent, also needs to emit greater than 100 or 250 tons per year, whichever is applicable, to be regulated.

4.1 *Potential to Emit for Criteria Pollutants*

Potential uncontrolled emissions for each applicable pollutant are calculated from the maximum design capacity listed in the application and assuming the unit operates every hour of every day of the year. Potential uncontrolled emissions are not realistic of the actual emissions and are used only to identify which air quality permit(s) and state and federal regulations are applicable.

DENR uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, DENR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, the applicant's application, or other methods to determine potential air emissions.

4.1.1 Dryers (Unit #2, #3 and #8) – Natural Gas

EPA's AP-42 document classifies ovens according to its gross heat rate. Small commercial dryers have a gross heat rate less than 100 million Btus per hour. The dryers on Unit #2, #3 and #8 are each rated at 2.0 million Btus per hour heat input. Based on the input capacity, the dryers are considered commercial dryers.

The emission factors for dryers burning natural gas are derived from AP-42, Table 1.4.1 and Table 1.4.2, 7/98. Table #4-1 lists the emission factors for dryers with input capacities less than 100 million Btus per hour utilizing natural gas.

Table #4-1: Natural Gas Emission Factors for Small Commercial Dyers

Air Pollutant	Emission Factor
Total Suspended Particulate	7.6 pounds/MMcf
PM10	7.6 pounds/MMcf
Sulfur Dioxide	0.6 pounds/MMcf
Nitrogen Oxide	100.0 pounds/MMcf
Carbon Monoxide	84.0 pounds/MMcf
Volatile Organic Compounds	5.5 pounds/MMcf

The heat content for natural gas averages 1,020 million Btus per million cubic foot. The potential amount of natural gas that can be consumed by the dryers is based on Equation #4-1.

Equation #4-1 – Potential Amount of Natural Gas Consumed

$$Natural\ Gas\ \frac{MMcf}{year} = heat\ input\ capacity\ \frac{MMBtus}{hour}\ x\ 8{,}760\ \frac{hours}{year} \div 1{,}020\ \frac{MMBtus}{MMcf}$$

The potential natural gas consumption for the three dryers is 51.5 million cubic feet per year (17.1 million cubic feet per year each).

4.1.2 Potential Emissions – Dryers Utilizing Natural Gas

Equation #4-2 was used to estimate the potential emissions of the dryers fired on natural gas.

Equation #4-2 – Potential Dryer Emissions (Natural Gas)

$$Potential\ \frac{tons}{yr} = Fuel\ consumed\ \frac{MMcf}{yr}\ x\ emission\ factor\ \frac{lbs}{MMcf} \times \frac{1}{2000}\frac{ton}{lbs}$$

Table #4-2 provides a summary of the potential emissions based on the firing of natural gas in the dryers.

Table #4-2: Emissions from Fuel (tons/year)

Unit	TSP	PM10	SO_2	NO_x	CO	VOCs
#2 Dryer	0.06	0.06	0.005	0.9	0.7	0.05
#3 Dryer	0.06	0.06	0.005	0.9	0.7	0.05
#8 Dryer	0.06	0.06	0.005	0.9	0.7	0.05
Total	**0.2**	**0.2**	**0.02**	**2.7**	**2.1**	**0.2**

4.1.3 Potential Emissions - Printing Presses, Evaporator, and Baler (Units #2 through #8)

The volatile organic compound (VOC) emissions from the five printing presses, evaporator, and baler are calculated based on the amount of product used, the material safety data sheets (MSDS). Under the existing permit issued December 2007, Graphic Packaging is required to submit annual reports on its actual emissions. The annual reports covering calendar years 2007 through 2011 identify the 12-month rolling totals for volatile organic compounds varied from 10 to 24 tons per 12-month periods.

During the 2007 review for the previous permit, Keith Beck, Graphic Packaging's Engineering Manager, mentioned the printing presses operate 17 hours per day for 365 days out of the year. According to this information, the printing presses operate 6,200 hours per year. The printing presses have the potential to operate 8,760 hours per year; therefore, DENR used a multiplying ratio of 1.4 for the presses to estimate the potential emissions from Graphic Packaging's actual emissions. A comparison of actual emissions versus potential emissions may be observed in Table #4-3.

Table #4-3: VOC Emissions for Printing Presses, Evaporator, and Baler

Air Pollutant	Actual (tons/year)	Potential (tons/year)
Volatile Organic Compounds (VOCs)	24	34

4.1.4 Total Potential Emissions

Table #4-4 summarizes the results of the potential emission calculations for the permitted units as taken from Tables #4-2 and #4-3 and shows the total facility potential to emit for each pollutant.

Table #4-4: Potential Emissions (tons/year)

Unit	TSP	PM10	SO_2	NO_x	CO	VOCs
Dryers (Unit #2, #3 and #8)	0.2	0.2	0.02	2.7	2.1	0.2
Printing Presses (Unit #2 through #8	-	-	-	-	-	33.3

Unit	TSP	PM10	SO_2	NO_x	CO	VOCs
Totals	**0**	**0**	**0**	**3**	**2**	**34**

Because emissions from the facility are below the major source threshold, Graphic Packaging is considered a minor source under the PSD program for criteria pollutants.

4.2 Potential to Emit for Greenhouse Gases

Graphic Packaging is considered an existing non-PSD source due to air emission and operational limits in their existing Title V air quality operating permit. The next step is to determine if Graphic Packaging has the potential to emit 100,000 tons per year of carbon dioxide equivalent emissions or more. There are six regulated greenhouse gases which are listed below:

1. Carbon dioxide;
2. Nitrous oxide;
3. Methane;
4. Hydrofluorocarbons;
5. Perfluorocarbons; and
6. Sulfur hexafluoride.

The greenhouse gas emission factors for firing the equipment with natural gas are from AP-42, Table 1.4-2, July 1998 and are listed below:

1. Carbon dioxide = 120,000 pounds per million cubic feet;
2. Nitrous oxide = 2.2 pounds per million cubic feet;
3. Methane = 2.3 pounds per million cubic feet.

Equation 4-2 was used to calculate potential greenhouse gas emissions. In the case of the greenhouse gases, the potential emissions of greenhouse gases needs to be multiplied by 1, 310, and 21 for carbon dioxide, nitrous oxide, and methane, respectively, to convert the results to carbon dioxide equivalent. The potential emissions for the greenhouse gases are summarized in Table 4-5.

Table 4-5 –Greenhouse Gas Potential Emissions (tons per year)

Equipment	Capacity	Carbon Dioxide	Nitrous Oxide	Methane	Carbon Dioxide Equivalent
Dryers (3 units)	51.2 million cubic feet per year	3,072	0.1	0.1	3,105
Insignificant Activities (36 units)	88.5 million gallons per year	5,310	0.1	0.1	5,343

Graphic Packaging is considered an existing non-PSD source with the potential to emit greater than 100,000 tons per year of carbon dioxide equivalent emissions. Therefore, Graphic Packaging is considered a minor source for greenhouse gases under the PSD program.

5.0 National Emission Standards for Hazardous Air Pollutants

Presently, there are no finalized or promulgated National Emissions Standards for Hazardous Air Pollutants standards applicable to this type of operation.

6.0 Maximum Achievable Control Technology Standards

DENR reviewed the Maximum Achievable Control Technology standards and determined the following may be applicable to Graphic Packaging.

6.1 Potential HAP Emissions

6.1.1 Dryers (Unit #2, #3 and #8) – Natural Gas

The emission factors for dryers burning natural gas are derived from AP-42, Table 1.4.1 and Table 1.4.2, 7/98. Table #4-1 lists the emission factors for dryers with input capacities less than 100 million Btus per hour utilizing natural gas.

Table #6-1: Natural Gas Emission Factors for Small Commercial Dyers

Air Pollutant	Emission Factor
Hazardous Air Pollutants	1.889 pounds/MMcf

The potential amount of natural gas that can be consumed by the dryers is based on Equation #4-1.

6.1.2 Potential Emissions – Dryers Utilizing Natural Gas

Equation #4-2 was used to estimate the potential emissions of the dryers fired on natural gas. Table #6-2 provides a summary of the potential HAPs based on the firing of natural gas in the dryers.

Table #6-2: Hazardous Air Pollutant Potential Emissions for Natural Gas

Unit	HAPs
#2 Dryer	0.02
#3 Dryer	0.02
#8 Dryer	0.02
Total	**0.06**

6.1.3 Potential Emissions - Printing Presses, Evaporator, and Baler (Units #2 through #8)

Under the existing permit issued December 2007, Graphic Packaging is required to submit annual reports on its actual emissions. The annual reports covering calendar years 2007 through 2011 identify the 12-month rolling totals for hazardous air pollutants varied from 3.7 to 8.4 tons per 12-month period. During the calendar years 2007 through 2011, the single highest hazardous air pollutant was ethylene glycol with actual emissions of approximately 5 tons per 12 month period.

DENR used a multiplying ratio of 1.4 for the presses to estimate the potential emissions from Graphic Packaging's actual emissions. A comparison of actual emissions versus potential emissions may be observed in Table #6-3.

Table #6-3: HAP Emissions for Printing Presses, Evaporator, and Baler

Air Pollutant	Actual (tons/year)	Potential (tons/year)
Ethylene Glycol	5.0	7.0
Total Hazardous Air Pollutants	8.4	11.8

6.2 40 CFR Part 63, Subpart KK

The processes used at the facility are subject to Maximum Achievable Control Technology (MACT) requirements. The five presses have wide-web flexographic printing capabilities. Therefore, Graphic Packaging is subject to 40 CFR Part 63, Subpart KK – National Emission Standards for the Printing and Publishing Industry. Federally enforceable limits will be placed in the permit so that Graphic Packaging is classified as a minor source for HAPs.

Subpart KK states that a facility may be classified as an area source by limiting its potential to emit through appropriate mechanisms that may be available through the permitting authority. Under Subpart KK, an area source must maintain records of all required measurements and calculations needed to demonstrate compliance as an area source and must have submitted an initial notification. Graphic Packaging's minor permit will include conditions that limit emissions to less than 10 tons per year of a single HAP and/or less than 25 tons per year of any combination of HAPs. The emission limits are based on a 12-month rolling total. The application for a minor permit submitted in 2004 was considered the submission of the initial notification.

7.0 State Requirements

Any source operating in South Dakota that meets the requirements of the Administrative Rules of South Dakota (ARSD) 74:36:05:03 is required to obtain a Title V air quality permit. Graphic Packaging's VOC emissions are less than 100 tons per year and HAP emissions are less than 10 tons per year for a single HAP and 25 tons per year of a combination of HAPs. Based on the emissions, Graphic Packaging is considered a minor source.

7.1 Minor Air Quality Permit

In previous reviews, Graphic Packaging requested enforceable limits in the permit to keep them out of the Title V air quality permit program. Graphic Packaging requested to keep the enforceable limits the same in its August 2012 renewal. The minor air quality permit will contain conditions that will limit actual emissions to less than or equal to 9.5 tons per 12-month rolling period of a single HAP, 23.8 tons per 12-month rolling period of any combination of HAPs, and 95 tons per 12-month rolling period for VOCs. Graphic Packaging will be required to inventory the amount of products used each month and the composition of the product based on the material safety data sheets and manufacturer supplied formulation data. The permit will contain conditions that require the actual HAP and VOC emissions be calculated on a monthly basis and submitted to DENR on an annual basis to determine compliance with the HAP and VOC limit.

7.2 State Particulate Emission Limit

In accordance with ARSD 74:36:06:02(1)(a), a fuel-burning unit with a heat input value less than 10 million Btus per hour may not exceed a particulate emission limit of 0.6 pounds per million Btus of heat input. The dryers on Units #2, #3 and #8 all have a heat input rating of less than 10 million Btus per hour (2.0 million Btus per hour each). Therefore, the particulate emission limit is 0.6 pounds per million Btus of heat input.

7.3 Sulfur Dioxide Emission Limits

In accordance with ARSD 74:36:06:02(1)(a), a fuel-burning unit may not emit sulfur dioxide emissions to the ambient air in an amount greater than 3 pounds of sulfur dioxide per million Btus of heat input.

7.4 Performance Tests

In accordance with ARSD 74:36:11:02, the Secretary of DENR may require a stack performance test if necessary to demonstrate compliance with the state's emission limits. At this time, DENR does not believe a stack performance test is warranted for the printing presses, dryers and evaporator. However, permit conditions will be included in the draft permit that will allow DENR to require a stack performance test if DENR believes a stack performance test is necessary in the future to demonstrate compliance.

7.5 Compliance Assurance Monitoring

Compliance assurance monitoring is applicable to permit applications received on or after April 20, 1998, from major sources applying for an air quality permit. Graphic Packaging's application was received after April 20, 1998. However, Graphic Packaging is requesting a minor air quality operating permit. Therefore, compliance assurance monitoring is not applicable.

7.6 Periodic Monitoring

Periodic monitoring is required for each emission unit that is subject to an applicable requirement at a source subject to Title V of the Federal Clean Air Act. Graphic Packaging has requested federally enforceable limits be placed on the operations. The federally enforceable limits will classify Graphic Packaging as a minor source. A minor source is not subject to periodic monitoring.

8.0 RECOMMENDATION

Any source operating in South Dakota that meets the requirements of the Administrative Rules of South Dakota (ARSD) 74:36:05:03 is required to obtain a Title V air quality permit. However, placing enforceable operational restrictions in the permit will limit Graphic Packaging's HAP emissions below the major source threshold under the Title V air quality permitting program. Therefore, Graphic Packaging will be required to operate within the requirements stipulated in the following regulations under the minor air quality permit program:

- ARSD 74:36:04 - Minor Operating Permits;

- ARSD 74:36:06 - Regulated Air Pollutant Emissions;
- ARSD 74:36:11 - Stack Performance Testing; and
- ARSD 74:36:12 - Control of Visible Emissions.

Based on information DENR received in the permit application, Graphic Packaging's minor air quality permit may be renewed. Any questions on this review should be directed to Ashley Brakke, Engineer I, Air Quality Program.